

Referee comments for the revised version of egusphere-2024-2587

A solid-state IR laser for two-step desorption/ionization processes in single-particle mass spectrometry

General comments:

The authors discuss the advantages and disadvantages of using a new type of IR-laser for laser desorption followed by REMPI and LDI by an UV laser on the example of various aerosol species.

The authors have considered all suggested revisions and made valuable changes to the manuscript. The publication is in a good shape, the addressed topics are appropriate with regard of the scientific importance and the structure and language are well understandable.

The supplementary information is of good quality.

I suggest publication in AMT after very few minor changes.

Specific comment:

line 22ff: "Additionally, we compared the novel two-step ionization scheme for the combined detection of aromatic molecules and inorganics with conventional single-step laser desorption/ionization (LDI) for the detection of polycyclic aromatic hydrocarbons (PAH) in laboratory and field experiments"

It is not completely clear to me, what this sentence should say. To me it sounds like you compared LD/REMPI for aromatics and inorganics with LDI only for PAH. Shouldn't it say:

We compared a novel two-step ionization (LD-REMPI/LDI) with the conventional single-step LDI regarding the potential to detect PAHs and inorganics in laboratory and field experiments.

Technical comments:

line 181: "each 500 diesel soot particles"

500 diesel soot particles each

line 232 and 234:

access the webpages again and change date of last access

line 258: "each 500 PAH mass spectra from ambient air particles"

500 PAH mass spectra from ambient air particles each

Table 2

Some lines are not separated by an empty line, in some lines the m/z are not aligned with the species. This has not been changed since the former version

Caption of Supplementary figure S1: "each $n = 1200$ "

n=1200 each

Figure S5:

The scale of the Meters AGL can be zoomed by about a factor of 2

Supplement line 34: “as discussed before”

as discussed in section 3.3